Red Cell Distribution Width Changes Influence Clinical Outcomes of Acute Decompensated Heart Failure

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Background: Increased red blood cell distribution (RDW) has been associated with adverse outcomes in patients with heart failure. We studied the association between baseline RDW and changes in RDW during hospital course with clinical outcomes in acute decompensated heart failure (ADHF) patients.
Methods and results: We prospectively studied 614 patients with ADHF. Baseline RDW and RDW change during hospital course were determined. The relationship between RDW and clinical outcomes after hospital discharge was tested using Cox regression models, adjusting for clinical characteristics, echocardiography findings and brain natriuretic peptide levels. During the follow up, 286 patients (46.6%) died and 84 were readmitted for ADHF (13.7%). Median RDW was significantly higher among patients who died compared to patients who survived (15.6% interquartile range [14.5 to 17.1] vs. 14.9% mg/L interquartile range [14.1 to 16.1], P < 0.0001). Compared with patients in the 1st RDW quartile, the adjusted hazard ratio [HR] for death or rehospitalization was 1.9 [95% CI 1.3-2.6] in patients in the 4th quartile. Changes in RDW during hospitalization were strongly associated with changes in mortality risk. Compared with patients with persistent normal RDW <14.5%), the adjusted HR for mortality was 2.0 [95% CI 1.2-3.3] for patients in whom RDW increased above 14.5 during hospital course, similar to patients with persistent elevation of RDW (HR was 1.7, 95% CI 1.2-2.3).
Conclusion: In patients hospitalized with ADHF, RDW is a strong independent predictor of greater morbidity and mortality. An increase in RDW during hospitalization also portends adverse clinical outcome.